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them under ashes,—this is in good seasons; in times of greater scarcity they devour the whole body. They ate all the white people who fell into their hands during the late war in the Free State.

When questioned on the subject by the Kaffir servants of the colonist,* the same Basuto said he had never eaten human flesh himself, but he owned to having seen others do so, and he knew all about it.

ON MICROCEPHALI; OR, HUMAN-APE ORGANISMS.†

By Professor CARL VOGT, Hon. F.A.S.L.

I PURPOSE in this memoir to treat of certain cases of idiotism, happily very rare, which are the result of a congenital insufficiency of the cerebral system, and which should be distinguished from such cases of idiotism as are produced by various maladies after birth.

The intellectual faculties may be more or less profoundly altered by a number of different causes. They may be disturbed momentarily, or for a more or less considerable length of time, or even through life, by acute or chronic attacks. They may even be almost entirely abolished by morbid causes, leaving pathological alterations, differing much in their nature, but resembling each other in their effects. We now know that the primary causes of these states of brutalisation, known by the names of idiotism or cretinism, may vary; that cretinism may be combined with thousand deformations, differing much from each other, of the osseous cranium, of the integuments and of the substance of the brain; that effusions, extravasation of blood, inflammations, partial or general dropsy, may induce similar effects as regards the intellectual life of the brain, and that these morbid states may anatomically be manifested by a number of frequently opposite alterations.

I do not intend to enter into the analysis of all these cases, which are the result of morbid conditions supervening in an originally normally constituted organ. I shall only treat of cases of microcephaly, properly so called; where, by an arrest of development—which supervened during the uterine life of the fœtus, and by causes as yet unknown—the brain of the embryo is struck before being definitively constituted, and where, consequently, the infant is born with a brain considerably less in volume, and profoundly modified in its essential forms. I also exclude monsters not viable, because of the greater or lesser deficiency of the brain; acephalous monsters, and anencephali (without brain). I confine myself to human products who are viable, and *who have lived*, in whom has been observed, from their birth, a brain too small, and a small cranium moulded on a defective brain.

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* Who was my informant.—J. B.

† We propose to publish, in a series of articles, a translation of the greater part of the important Memoir which M. Vogt has recently published on the above subject. We are glad to announce that we do so with the author's sanction and cooperation.—EDITOR.

Apart from any other quality of form or structure, the cerebral mass, in the genus *homo*, ought to have a minimum of volume and weight, below which it cannot descend without the cerebral functions, and, in the first place, those of the intelligence becoming sensibly affected. Microcephaly constitutes, as the Greek word justly expresses it, that condition in which the cranium, and the brain contained in it, have not reached the limit assigned to the species, and in which already, before birth, the cerebral functions are disturbed in consequence of arrest of development.

Cases of microcephaly are, I repeat, rare. The crania and the brain of microcephali are the most valuable objects in pathological collections. Despite long continued researches, I have, in the whole scientific literature, only found notices of about forty cases, and even of these there are, probably, some belonging to the category of idiotism from disease. I shall only mention the cases which I could not examine myself, by citing the sources I have taken them from. I shall, however, treat, in detail, of the crania and casts of the brain, which have kindly been placed at my disposal by the directors of the respective museums to which they belonged. Owing to the liberality of Messrs. Henle, of Goettingen; Reichert and Virchow, of Berlin; Luschka, of Tubingen; Welcker, of Halle; Koellicker and Recklingshausen, of Wurzburg; Graeser, of Eichberg (Nassau); Krauss, of Stuttgard, I have been enabled to present—at the sitting of the Natural History Section of the Genève Institute, June 6, 1866—nine well characterised crania of microcephali, which form pretty nearly the whole inventory of Germany, as regards this formation. I am also indebted for many particulars, and pieces for comparison, to Messrs. Ecker, of Freiburg; Frey, of Zurich; Theile, of Weimar; Capellini, of Bologna; Klebs, of Berne; Dr. Schaerer, of Waldau; De la Harpe, of Lausanne; Broca and Quatrefages, of Paris: to all of whom I return sincere thanks.

In this first memoir, I only give the particulars of German microcephali, for the history of which I was enabled to collect all the materials, excepting two brains preserved in alcohol. I shall, in supplements, treat of such, the materials for which are as yet incomplete. There seems to hover an evil star over all the materials formerly collected at Paris. Despite the researches of my friend, M. Broca, none of the objects examined by MM. Cruveilhier, Baillarger, and Gratiolet, have been discovered,—a fact the more to be regretted, as the collection contained the only known cranium of a Negro microcephalus.

As I had no brains at my disposal I was obliged to confine my researches to crania and casts of the cranial cavity. I have given the *contours* of all the objects in natural size in geometrical projection. Some of the figures have been drawn with the apparatus of Lucae; but for the great majority of the objects I have used the diagraph of Gavard of Paris, an excellent instrument, not less exact than that of Lucae, and more easy in application for the designer.

All my drawings, excepting two views of the bases of crania, are taken upon a uniform position of the cranium, in which the superior margin, or the axis of the zygomatic arch, is parallel to the horizontal plane. It is known that this plane has been adopted by the Anthropologists who met at Goettingen, and in the works of MM. Ecker, Lucae, His, Rutimeyer, as well as in my own work on Man. I have reduced to the same position the drawings of the casts of the internal cavity representing the brain, in the conviction that the contents should be seen in the same manner as the capsule. The crania and the casts, being all drawn in natural size, may easily be compared with each other, by superposing the traces upon tracing paper. But here we must explain the mode of superposing these traces. I place the traces of the profile in such a manner that the median points of the naso-frontal suture exactly cover each other, and I reduce in the view of the profile the zygomatic arch to the horizontal plane. The differences in the *contours* are then seen at once, and are much more easily understood than by long descriptions. The division of my work was indicated by the nature of my subject. I first treat of the microcephali which have become known to me, citing all the sources where notices of them may be found, as well as the museums containing the preparations.

I then proceed to a detailed description of these pieces, reporting at the same time textually, as far as I had access to these documents, all that the respective authors said on these cases. I should have wished to separate, in order to insert them at a more appropriate place, the notices on the cranium and the brain, from the intellectual manifestations and the biography of these beings; but, to my regret, this was not always possible. I have, therefore, in the first chapter reported all that appeared to me important, confining my own observations to the cranium alone. I thus pass in review first the adults, and then infant microcephali, and summarise the facts in separate articles. I finish this chapter by a general summary on the conformation of crania, treating especially of prognathism and of the position of the great occipital foramen.

In the second chapter I proceed to the examination of the brain by the aid of internal casts of the cerebral cavity. I examine the volume, the relation of the different parts and lobes, the convolutions and the relations of certain parts to some localised faculties.

The third chapter is devoted to the study of the manifestation of life, both somatic and intellectual. Amongst the cases will be found one of a microcephalous girl still living in the Canton of Berne.

The fourth chapter finally contains some general remarks on the causes of microcephaly, its relations to normal conformations, and on the results obtained for science in general, and the theory of Darwin in particular.

LIST OF KNOWN MICROCEPHALI, THE AUTHORS WHO HAVE DESCRIBED THEM, AND THE MUSEUMS IN WHICH THE PREPARATIONS ARE PRESERVED.

(*a*) GERMANY.

1. Gottfried Maehre, of Ratzum, died aged 44 years; Tables I-IV. The entire cranium is in the Museum of Halle.

   J. G. Carus, Atlas der Cranioscopie, Tab. IV, 1843.

   Hermann Welcker, Untersuchungen über Wachsthum und Bau des Menschlichen Schaedels, 1862. Some measurements of this cranium as well as of No. 4.

2. Michael Sohn, of Kiwittsblott, near Bromberg, died aged 20 years. Plates 5-7.

3. Friederich Sohn, his brother, died aged 18? Pl. 8-10. The entire skeleton of the former, and the cranium of the latter, are in the Berlin Museum.

   Johannes Müller, Nachrichten über die beiden Mikrocephalen zu Kiwittsblott bei Bromberg in Medicinische Zeitschrift für Heilkunde in Preussen, 1836, Nos. 2 and 3.

4. Conrad Schuettelndreyer, of Buckeburg, died aged 31. Pl. 11-13. The cranium is in the Museum of Goettingen.

   Blumenbach, De anomalis et vitiosis quibusdam nisus formationis aberrationibus. 1813.

   Foerster, Atlas der Missbildungen: Handbuch der speziellen Pathologischen Anatomie, 1834, p. 406, pl. 17.

5. Microcephalus, of Jena, died aged 26. Pl. 14-16. The cranium and the brain are in the Goettingen Museum.

   Theile, Ueber einen Microcephalus in Zeitschrift für rationelle Medicin, von Henle und Pfeufer. Third series, vol. xi, p. 210, 1861.

6. Louis Racke, of Hofheim (Nassau), died aged 20. Pl. 17 and 18. The cranium is in the Museum of the Hospital at Eichberg, near Eltville (Nassau).
7. Margareta Maehler, of Reineck, died aged 33. Pl. 19-21. The cranium is in the Museum of Würzburg.
   Virchow, Gesammelte Abhandlungen zur wissenschaftliche Medicin, 1856, p. 947.
   O. Schröder, Krankengeschichte und Sectionsbericht in Archiv für wissenschaftliche Medicin, von Virchow, vol. xx, p. 358. Foerster. See No. 4.
8. Johann Moegle, of Plattenhardt, near Stuttgard, died aged 15. Pl. 22, 23. The cranium is in the Tübingen Museum, No. 14.
9. Jacob Moegle, the cousin of the preceding, died aged 10. Pl. 24-26. The cranium is in the Stuttgard Museum, No. 13.
10. Johann George Moegle, brother of the preceding, died aged 5. Pl. 25, 26. The cranium is in the Tübingen Museum, No. 12.
    Jaeger, Zur Geschichte hirnarmer Kinder: Medicinisches Correspondenzblatt des Würtembergischen aerztlichen Vereins, vol. ix, 1839, No. 28.

(*b*) FRANCE.

11, 12, 13. Three cases mentioned in Cruveilhier, Anatomie Pathologique, liv. 30, pl. 4.

14. A case described by Blachez in Bulletin de la Société Anatomique de Paris. 2me série, vol. i, Juillet 1856.
15. Case of 4 years; cranium and brain confided by M. Giraldes to M. Gratiolet.
    Gratiolet, Observations sur la Microcéphalie, in Bulletins de la Société d'Anthropologie de Paris, vol. i, p. 34.
    Gratiolet, *ibid.*, vol. ii, p. 68.
    Gratiolet et Leuret, Anatomie comparée du Système Nerveux. Atlas, pl. 24.
16. Another case of 4 years. Cranium and brain given by M. Giraldes to M. Gratiolet.
    Gratiolet et Leuret, Anatomie comparée du Système Nerveux. Atlas, pl. 32.
    Gratiolet, Observations sur la Microcéphalie, in Bulletins de la Société d'Anthropologie de Paris, vol. i, p. 34.
17. Case presented by M. Broca to the Anthropological Society of Paris.
18. Girl, aged 4 years, presented by M. Baillarger before the Académie de Médecine.
    Annales Médico-psychologiques, par Baillarger: Cerise et Moreau, 3me série, tome 2me, p. 473, 1856.
19. Boy, two years of age, observed by M. Joly, mentioned by M. Baillarger in the same note, p. 471.

(*c*) ENGLAND.

20. Cranium, preserved in the College of Surgeons. Male.
Owen, Osteology of the Chimpanzee,—Transactions of the Zoological Society, vol. i, p. 343.

21, 22. Two crania and brains, in the Museum of St. Bartholomew's Hospital. Described in the Catalogue of that Museum.

23. Case of a female, aged 42 years.
Gore, Notice of a case of Microcephaly, in Anthropological Review, vol. i, p. 169.
Defert, Rapport sur la Notice de M. Gore, Bulletins de la Société Anthropologique de Paris, vol. v, p. 15.

24, 25. Two cases, boy aged 11, and girl aged 7 years. Conolly. Dublin Quarterly Journal, August 1865.

26. One case. Peacock, Notes on a case of Congenital Atrophy of the Brain, and Idiotcy, in Reports of the Pathological Society of London, vol. x, session 1858-1859.

27. One case. Willis, Cerebri Anatome. Genève, 1860, p. 20.

28. Young girl, of Cork. Cranium preserved in the Museum of the College of Surgeons.
Spurzheim, Anatomy of the Brain. London, 1826.

29. Brain of a boy aged 12, presented by Mr. Marshall. Marshall, Anthropological Review, vol. i, p. 8, May 12, 1863.
Defert, Rapport sur la Revue Anthropologique de Londres, in Bulletins de la Société d'Anthropologie de Paris, vol. v, p. 560.
At the meeting of the Anthropological Society of London, May 1, 1866, Dr. Down observed that there were many cases of living Microcephali of a very low organisation. Dr. Beigel added, that he had seen fifteen of them at Colney Hatch.—Journal of the Anthropological Society, No. 15, October 1866, p. 182.

(*d*) HOLLAND.

30. Cranium, preserved in the Museum of Leyden, the individual died at the age of 20.
Sandifort, Museum Anatomicum Academiæ Lugduni Batavorum, vol. iv, Tab. 690-691.

(*e*) SWITZERLAND.

31. A boy, aged 9 years, died at Abendberg, near Interlaken.
Vrolik, Beschrijwing van gebrekkigen Hersen-en Schedel-Vorm. Amsterdam, 1854.

32-34. Three cases, among five infants, at St. Leonard, near Sion.
Baillarger, Annales Médico-Psychologiques, 3me série, vol. ii, p. 460.

35. A. R., girl, aged 5, died at Abendberg, near Interlaken. Autopsy by Professor Valentin of Berne, in
J. Guggenbühl, Die Heilung und Verhütung des Cretinismus und ihre neuesten Fortschritte, Bern und St. Gallen, 1853, p. 56.

36. Marie-Sophie Wyss, aged 16 years. Still living, in the hospice for poor and sick females, established by the government of the canton Bern, in the château Hindelbank, near Berne.

(*f*) ITALY.

37, 38. Two cases. One of the crania which belonged to an individual aged 36, is in the Museum of the Hospital of S. Spirito, at Sassia; the other, aged 19, is in the Museum of Manicomio, at Rome.

Bastonelli, Sopra due casi di microcefalia. Bolletino delle scienze mediche. Bologna, anno 31, ser. iv, vol. xi, Febbrajo, 1859.

G. C. Carus, Zur vergleichenden Symbolik zwischen Menschen und Affenskelet. Act. Acad. Leop. Naturæ Curiosorum, vol. xxviii, 1861.

(*g*) ASIA.

39. Mahratta girl, aged 16.

John Shortt, Description of a living Microcephale,—Journal of the Anthropological Society, No. 15, October 1866, p. 181.

(*h*) AMERICA.

40, 41. The two Aztecs exhibited in Europe; boy Maximo, and the girl Bartola. The head of one of these is said to be in the Museum of Berlin.

Leubuscher, Ueber die Azteken, in—Notizen aus der Natur und Heilkunde, von Froriep, 1856, vol. ii, Nos. 6, 7.

C. G. Carus, Ueber die sogenannten Aztekenkinder, in—Berichte der Akademie in Berlin; Mathematisch-physikalische Classe, 1856, p. 11.

(*i*) AFRICA.

42. Negress, aged 14.

Gratiolet, Observations sur la Microcephalie; Bulletins de la Société d'Anthropologie de Paris, vol. i, p. 34; vol. v, p. 18.

A general treatise, by R. Wagner, on the structure of the brain of microcephali compared with that of the normal brain in man and apes, appeared in 1862 under the title of, "Vorstudien zu einer wissenschaftlichen Morphologie und Physiologie des Menschlichen Gehirns als Seelenorgan." Zweite Abhandlung Ueber den Hirnbau der Mikrocephalen mit vergleichender Rucksicht auf den Bau des Gehirns des Normalen Menschen und der Quadrumanen.

R. Wagner treats here specially of the Jena case (No. 5), and cites the cases of the Sohns (Nos. 2 and 3); Maehre (No. 1), of Gratiolet (Nos. 15, 16, and 34); the child, aged fourteen, described by Baillarger (No. 34); the two cases of Conolly (Nos. 21 and 22), of Cruveilhier (Nos. 11-13), of Plattenhardt (Nos. 8-10), two children of Roringen, near Goettingen, who have not been scientifically examined; the case of Schutteludreyer (No. 4), that of Leyden (No. 28), of Maehler (No. 7), and that of Abendberg described by Vrolik.

About the same time Wagner gave a general *résumé* of his views on microcephali, in the "Archiv für Naturgeschichte," of Troschel, 1861, vol. i, p. 63.

M. Gratiolet gives also a summary of his studies on this subject in a "Mémoire sur la microcéphalie considérée dans ses rapports avec la question des caractères du genre humain," in Mémoires de la Soc. d'Anthrop. de Paris, vol. i, p. 61, 1860-1863.

TABLE OF CASES OF MICROCEPHALY, WHOSE AGE AND SEX WERE ASCERTAINED. ARRANGED ACCORDING TO AGE.

Nos. of Order.	Name and Indication of Case.	No. of the preceding list.	Age. Years.	Sex.
1	Gottfried Maehre	1	44	Male.
2	Case of Mr. Gore	23	42	Female.
3	Case of Sassia (Bastanelli)	37	36	Male.
4	Margaritha Maehler	7	33	Female.
5	Schutteludreyer	4	31	Male.
6	Case of Jena	5	26	,,
7	Michel Sohn	2	20	,,
8	Case of Leyden	30	20	,,
9	Louis Racke	6	20	,,
10	Case of Rome (Bastanelli)	38	19	,,
11	Frederic Sohn	3	18	,,
12	Aztec Maximo	40	17	,,
13	Sophie Wyss	36	17	Female.
14	Maharatta girl	39	16	,,
15	Johann Moegle	8	15	Male.
16	Negress (Baillarger)	42	14	Female.
17	Aztec Bartola	41	14	,,
18	Case of Mr. Marshall	29	12	Male.
19	Case of Dr. Conolly	24	11	,,
20	Jacob Moegle	9	10	,,
21	Case of Abendberg (Vrolik)	31	9	,,
22	Case of Dr. Conolly	25	7	Female.
23	Johann George Moegle	10	5	Male.
24	A. R., of Abendberg (Valentin)	35	5	Female.
25	Case of M. Giraldes	15	4	Male.
26	Case of M. Giraldes	16	4	,,
27	Case of M. Baillarger	18	4	Female.
28	Case of M. Cruveilhier	12	3	Male.
29	Case of M. Joly	19	2	,,
30	Case of M. Cruveilhier	11	8 months	,,
31	Case of M. Cruveilhier	13	new-born.	,,

Of these thirty-one cases, nine are of the female sex. In eight other cases, the age of which is unknown but the sex indicated, there is one female (case of Cork, No. 28); there are thus about 25·6 per cent. or one-fourth of the female sex.

[*To be continued.*]

THE ANTIQUITY OF MAN.

How fully have the discoveries and researches of geologists confirmed the remarks of the poet,—

> "The dust we tread upon was once alive."

Everywhere, at various depths, and in various kinds of strata, have the numerous remains of living organisms been found,—the remains of living beings that played their part upon the earth for a time and then disappeared. The geologist has not only ascertained that such dust once lived, but has also arrived at a knowledge of the time which has elapsed since it was alive; so that we talk of the epochs of palæontology very much in the same manner as we do of those of history. Who among the wisest sages, three centuries ago, could have predicted that the crust of this planet should tell such a wonderful story—a story by which a knowledge of the various changes which it has undergone would be carried back millions of years? Who could have foretold then that so many generations of extinct creatures were entombed in the hard rocks, and preserved in a fossil state through periods of time in comparison with which the duration of Egyptian pyramids, catacombs, and mummies, is as insignificant as the lifetime of an ephemeride. Strange tales have, indeed, been told by mammoths, mastodons, plesiosauruses, and trilobites. We are startled when we open any well-written geological work, and read of the successive genera of animals which have inhabited this world, each one lasting its day,—which was doubtless a long one,—and another coming to act its part after it;—when we find it stated, that what is hill was once valley, and that what is valley was once hill;—that what is sea was once land, and that what is land was once sea;—that what is hard and compact rock, was once loose and incoherent sand; and that what is now loose and incoherent sand, was once hard and solid rock;—that our loftiest and most majestic mountains, with their bold granite peaks, defying the elements, were once slag and mud; and that what now forms mud at the bottom of the ocean formed, during olden times, the bold crests of elevated mountain ridges. While reading